The role of fullerene shell upon stuffed atom polarization potential

MIRON AMUSIA, Racah Institute of Physics, Hebrew University, LARISSA

CHERNYSHEVA, Ioffe Institute — We have demonstrated that the polarization of

the fullerene shell considerably alters the polarization potential of an atom, stuffed

inside a fullerene. This essentially affects the electron elastic scattering phases as well

as corresponding cross-sections. We illustrate the general trend by concrete exam-

ples of electron scattering upon endohedrals that are formed when Ne and Ar atom

are stuffed inside fullerene C60. To obtain the presented results, we have suggested

a simplified approach that permits to incorporate the effect of fullerenes polariz-

ability into the endohedrals polarization potential. By applying this approach, we

obtained numeric results that show strong variations in shape and magnitudes of

scattering phases and cross-sections due to effect of fullerene polarization upon the

endohedral polarization potential. Using concrete examples we have demonstrated

that the elastic scattering of electrons upon endohedrals is an entirely quantum me-

chanical process, where addition of even a single atom can qualitatively alter the

multi-particle cross-section.